$$\mathcal{E}mf = V_t + Ir$$

$$1.000V = 0.87V + (0.87A)r$$

$$r = 0.15\Omega = \underline{0.149\Omega}$$

Q2 $12.0 - 4.6 =$ **7.4V**

Q3 $R_T = ?$ 66.9Ω

$$I = 0.239A$$

$$P = I^2R$$

$$= \boxed{2.74W}$$

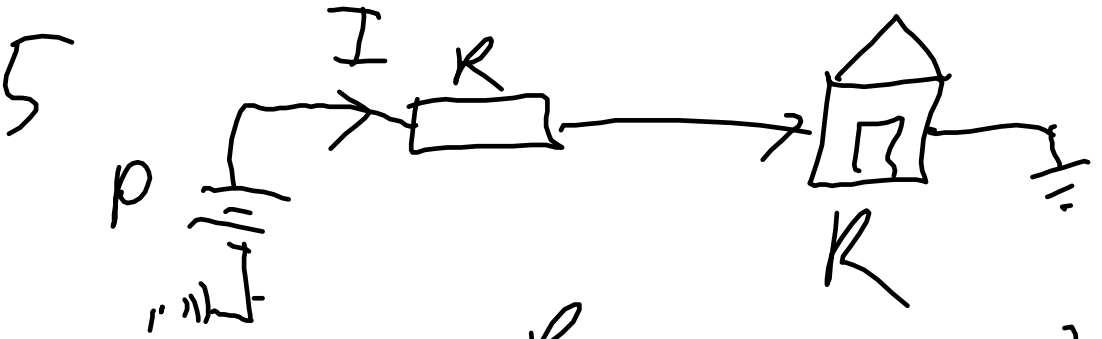
Q4

$$I = \frac{V}{R} = \frac{8.2V}{100}$$

$= 0.082\,A$

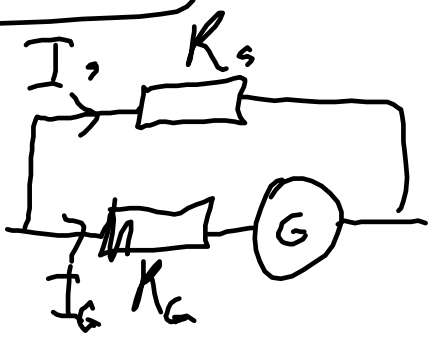
$82\,mA$

5



$$I = \frac{P}{V} \qquad P_R = I^2 R$$

$$\boxed{2.4 \times 10^5\,W}$$



Q6 30C

Q7 $\boxed{4.3 \times 10^{-4}\,\Omega}$

Q8 $P = I^2 R$

$$I = \sqrt{\frac{P}{R}} = \sqrt{\frac{0.5\,W}{250\,\Omega}}$$

$$I = 0.0447\,A$$

$I = 0.0444\,A$

$\boxed{V = 20V}$

Q 9

$\boxed{r = 2.0\Omega}$

$$\frac{I_2}{I_1} = 4 \begin{cases} P_1 = I_1^2 r = 50w \\ P_2 = I_2^2 r = 200w \end{cases}$$

$I_2 = 2I_1$

$60V - I_1 r - I_1 10 = 0$

$60V - 2I_1 r - 2I_1 4 = 0$